

Claims

1. A method of providing an interface over a network between a client computer and a server for controlling telephony equipment, comprising the steps of:
 - 5 a) sending over the network to the client computer a first section of code including software elements which when loaded in web browser software enable a user of the client computer to issue commands to the server; and
 - b) sending over the network to the client computer a second section of code as a stream which includes event notifications generated dynamically by the
10 server in response to said telephony equipment, wherein at least some of the event notifications in the second section are adapted to update in the browser software one or more software elements received in the first section;whereby the first section provides a browser-based interface suitable for
15 transmitting user generated events and the second section provides a mechanism for updating the browser with notifications of events provided by the telephony equipment.
2. A method as claimed in claim 1, wherein the first and second sections are
20 provided as first and second frames within a single web page.
3. A method as claimed in claim 2, wherein the second frame is encoded for interpretation as a hidden frame.
- 25 4. A method as claimed in claim 1, wherein the second section is generated as an open-ended stream of code which continues to be generated by the server in response to new events notified by the telephony equipment while the communication with the client computer remains open.
- 30 5. A method as claimed in claim 4, wherein the second section is provided as dynamic mark-up language code in the form of a series of discrete components

which encode discrete software elements for interpretation by the browser software.

6. A method as claimed in claim 5, wherein the discrete software elements are
5 Java or JavaScript elements.

7. A method as claimed in claim 1, further comprising sending over the network a third section of code, said third section including a web services description of web services available on said server which enable remote control of the
10 telephony equipment, whereby the software elements from the first section operate in conjunction with the web services description from the third section to enable the generation of appropriate commands to access the web services offered by the server, and thereby to control the telephony equipment.

8. A method as claimed in claim 7, wherein the first and second sections are
15 transmitted as first and second frames in a web page, and the third section is transmitted each time said web page is requested.

9. A method as claimed in claim 7, further comprising monitoring said network
20 for commands from the client to operate the web services.

10. A method as claimed in claim 9, further comprising translating commands received from the client to operating commands for the telephony equipment.

11. A method as claimed in claim 1, further comprising the steps of monitoring a
25 first communications session including said first and second sections between the client computer and the server, and of monitoring a second communications session between the telephony equipment and a remote item of telephony equipment, whereby events occurring in the first and second communications
30 sessions are synchronised with one another.

12. A method as claimed in claim 11, wherein the first communications session is controlled by a session manager which is in communication with a web server and the second communications session is controlled by a computer telephone integration manager which is in communication with said telephony equipment, the session manager passing commands received from the client computer to the computer telephone integration manager, and passing event notifications received from the computer telephone integration manager to the web server.

13. A method of receiving an interface over a network from a server for controlling telephony equipment, comprising the steps of:

- a) receiving over the network a first section of code including software elements which when loaded in web browser software enable a user of the browser software to issue commands to the server; and
- b) receiving over the network a second section of code as a stream which includes event notifications generated dynamically by the server in response to said telephony equipment, wherein at least some of the event notifications in the second section are adapted to update in the browser software one or more software elements received in the first section;

whereby the first section provides a browser-based interface suitable for transmitting user generated events and the second section provides a mechanism for updating the browser with notifications of events provided by the telephony equipment.

14. A method as claimed in claim 13, wherein the first and second sections are received as first and second frames within a single web page.

15. A method as claimed in claim 14, wherein the second frame is interpreted within the browser as a hidden frame.

16. A method as claimed in claim 13, wherein the second section is received as an open-ended stream of code which continues to be generated by the server in

response to new events notified by the telephony equipment while the communication with the browser software remains open.

17. A method as claimed in claim 16, wherein the second section is received as
5 dynamic mark-up language code in the form of a series of discrete components which encode discrete software elements for interpretation by the browser software.

18. A method as claimed in claim 17, wherein the discrete software elements are
10 Java or JavaScript elements.

19. A method as claimed in claim 13, further comprising receiving over the network a third section of code, said third section including a web services description of web services available on said server which enable remote control
15 of the telephony equipment, whereby the software elements from the first section operate in conjunction with the web services description from the third section to enable the generation of appropriate commands to access the web services offered by the server, and thereby to control the telephony equipment.

20. A method as claimed in claim 19, further comprising sending to the server
20 commands to operate the web services in response to user actions in the browser.

21. An electrical signal encoding a web page, the web page comprising at least two frames, wherein one of said frames is a hidden frame generated as a section of
25 dynamically generated code in response to event notifications from a computer telephone integration application and the other of said frames is a visible frame adapted to be modified within a browser in response to particular events received in the second section and including web page elements enabling a user to issue commands to said computer telephone integration application.

22. An electrical signal as claimed in claim 21, further comprising a section of code describing a command set for controlling web services, said command set being associated with said web page elements in the visible frame, whereby a user activating at least one of said web page elements causes a command to issue from a browser to control a remote web service and thereby control said computer telephone integration application.

23. Apparatus for providing an interface over a network between a client computer and a server for controlling telephony equipment, comprising:

- 10 a) a first code generator for generating a first section of code including software elements which when loaded in web browser software enable a user of the client computer to issue communications control commands to the server;
- 15 b) a second code generator for generating a second section of code as a stream, said second code generator being in direct or indirect communication with said telephony equipment and being configured to generate event notifications in response thereto, wherein at least some of the event notifications in the second section are adapted to update in the browser software one or more software elements received in the first
- 20 section;

whereby the first section provides a browser-based interface suitable for transmitting user generated events and the second section provides a mechanism for updating the browser with notifications of events provided by the telephony equipment.

24. A computer including a memory storing a web page, and a processor executing web browser software which displays said web page, wherein said web page comprises at least two frames, wherein one of said frames is a hidden frame generated as a stream of dynamically generated code in response to event

30 notifications from a computer telephone integration application and the other of said frames is a visible frame adapted to be modified within a browser in response

to particular events received in the second section and including web page elements enabling a user to issue commands to said computer telephone integration application.

- 5 25. A computer network including a client and a server connected across the network, wherein:

the server comprises:

- 10 a) a first code generator for generating a first section of code including software elements which when loaded in web browser software enable a user of the client computer to issue communications commands to the server; and
- 15 b) a second code generator for generating a second section of code as a stream, said second code generator being in direct or indirect communication with said telephony equipment and being configured to generate event notifications in response thereto, wherein at least some of the event notifications in the second section are adapted to update in the browser software one or more software elements received in the first section; and

the client comprises:

- 20 a memory storing a web page, and a processor executing web browser software which displays said web page, wherein said web page comprises at least two frames, wherein one of said frames is a hidden frame generated from said second section, and the other of said frames is a visible frame generated from said first section,

- 25 whereby the first section provides a browser-based interface suitable for transmitting user generated events and the second section provides a mechanism for updating the browser with notifications of events provided by the telephony equipment.

26. A computer program product in machine readable form comprising instructions which, when executed on a server having control of telephony equipment, are effective to cause the server to:

- a) send over the network to the client computer a first section of code including software elements which when loaded in web browser software enable a user of the client computer to issue commands to the server; and
- b) send over the network to the client computer a second section of code as a stream which includes event notifications generated dynamically by the server in response to said telephony equipment, wherein at least some of the event notifications in the second section are adapted to update in the browser software one or more software elements received in the first section;

whereby the first section provides a browser-based interface suitable for transmitting user generated events and the second section provides a mechanism for updating the browser with notifications of events provided by the telephony equipment.

27. A computer program product in machine readable form comprising instructions which, when executed on a computer connected to a network are effective to cause the computer to:

- a) receive over the network a first section of code including software elements which when loaded in web browser software enable a user of the browser software to issue commands to the server; and
- b) receive over the network a second section of code as a stream which includes event notifications generated dynamically by the server in response to said telephony equipment, wherein at least some of the event notifications in the second section are adapted to update in the browser software one or more software elements received in the first section;

whereby the first section provides a browser-based interface suitable for transmitting user generated events and the second section provides a mechanism

for updating the browser with notifications of events provided by the telephony equipment.